DISCOVER-AQ

HSRL Data Summary

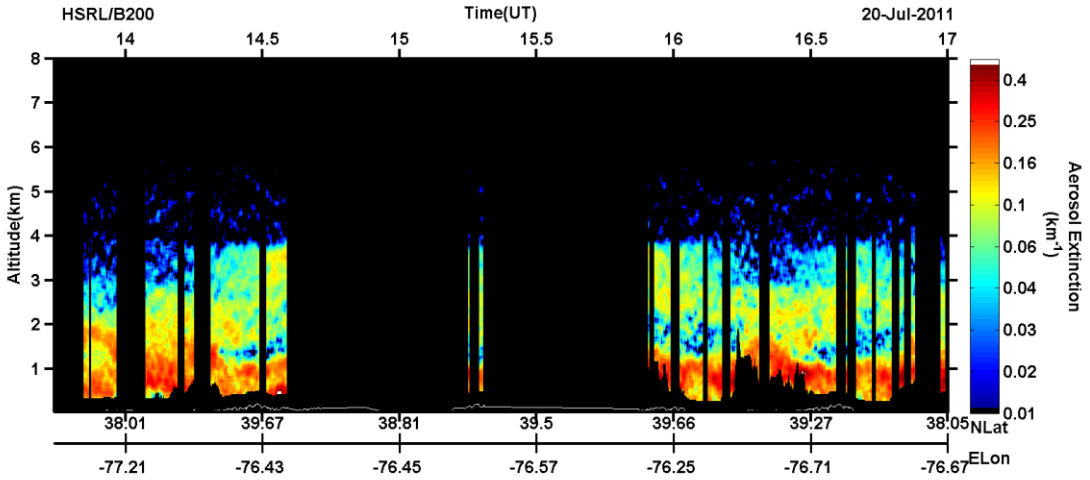
FLIGHT: Morning science flight (1 of 2)

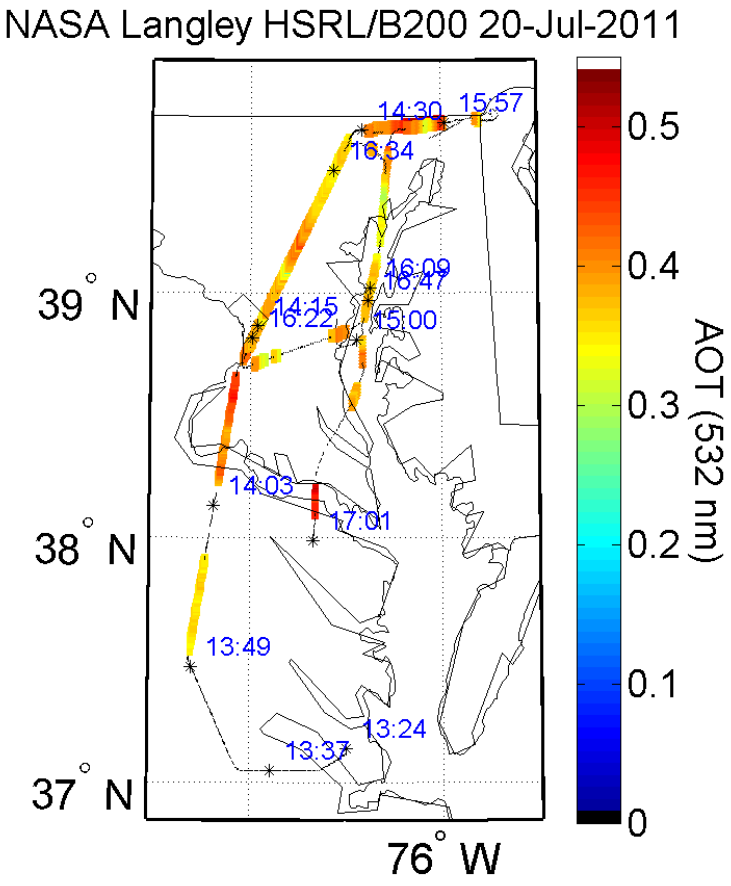
DATE: July 20, 2011

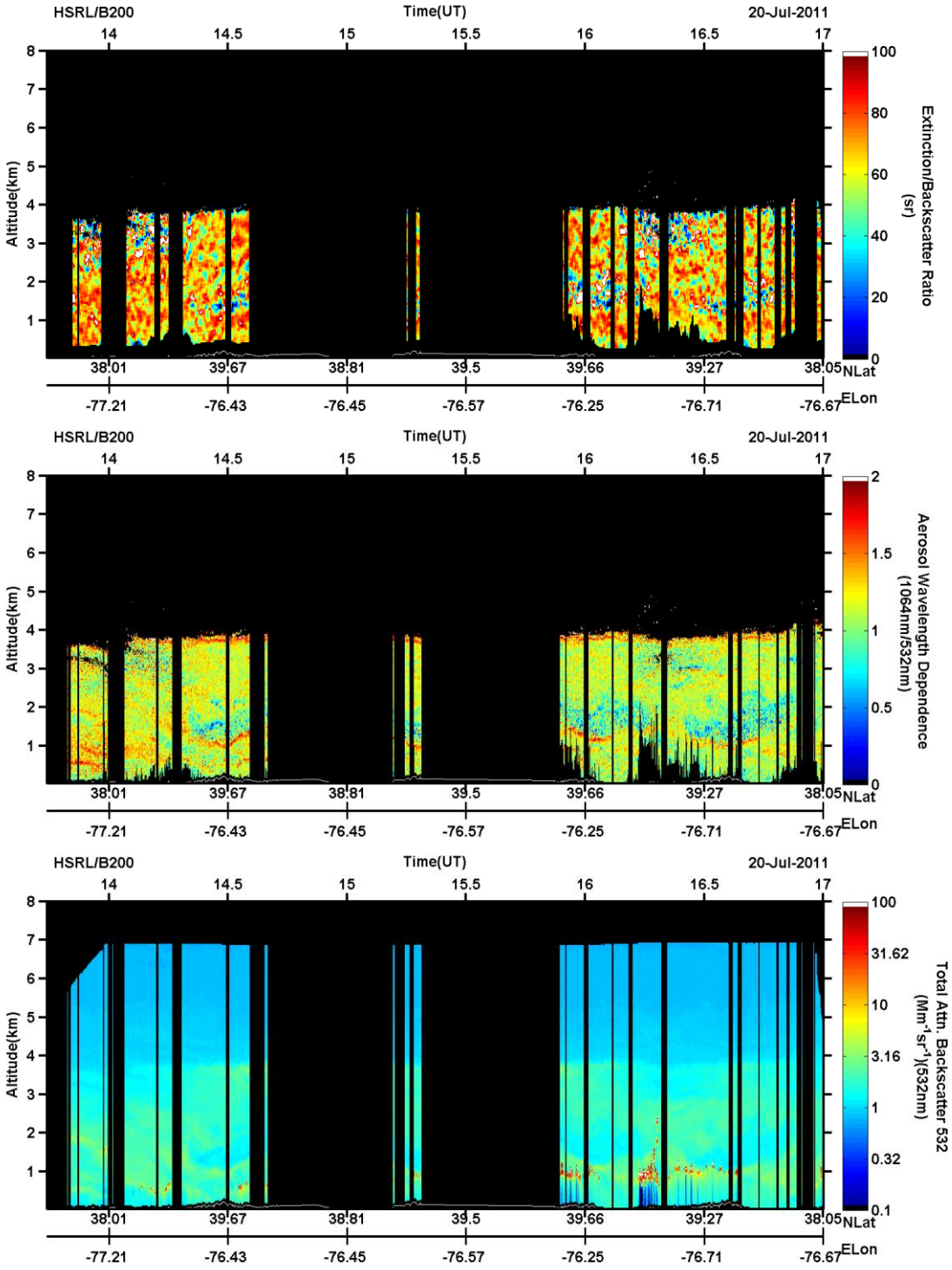
DURATION: 3.9 hours

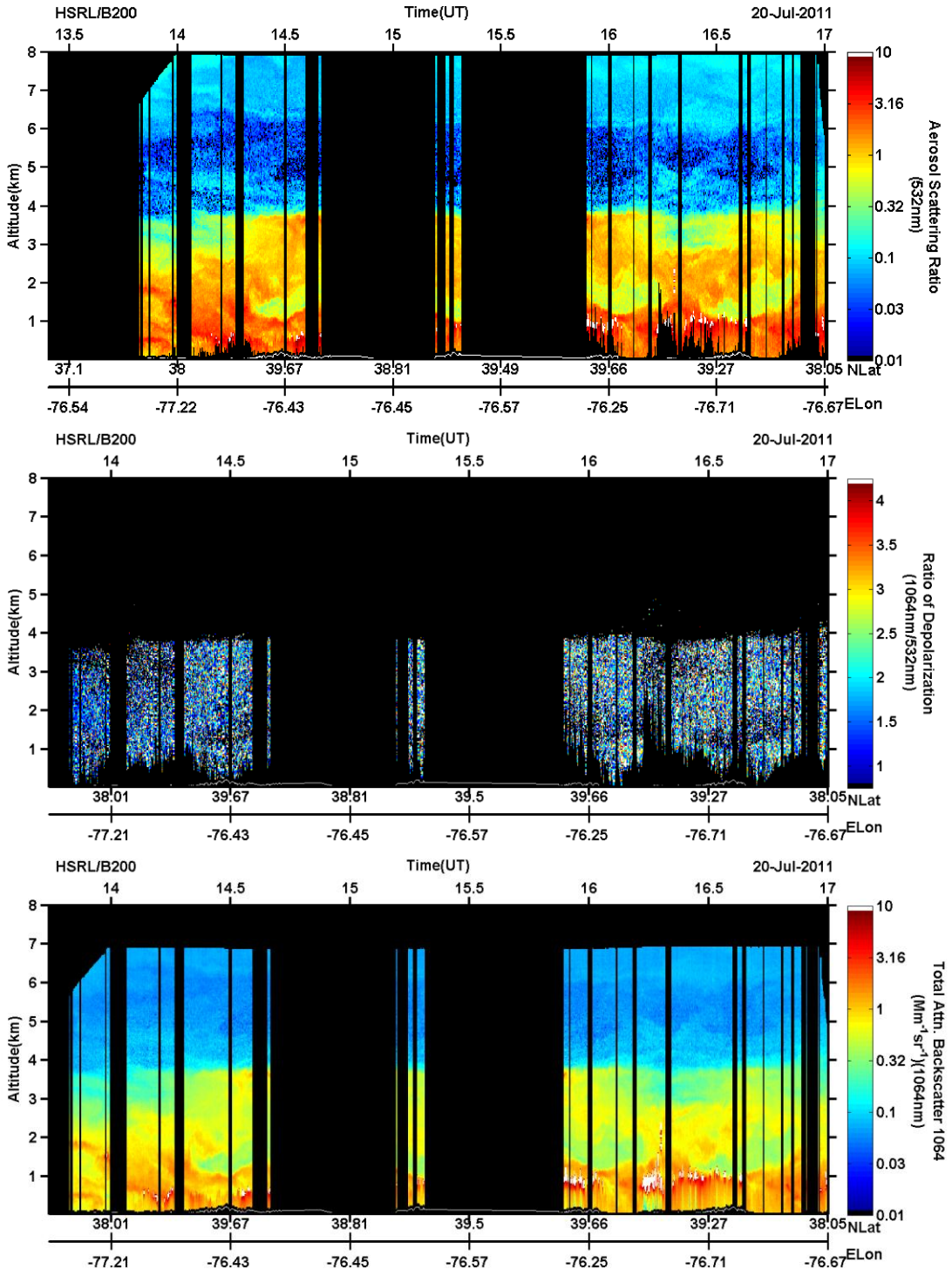
SUMMARY: Takeoff was at 9:30 AM local time from Newport News, VA. Aerosol levels were enhanced as expected due to the hot, humid, hazy conditions. A few scattered cumulus clouds were in the region of study. HSRL experienced a laser spectral purity issue that prevented data for roughly 1 hour during a part of the flight. Otherwise, HSRL operation was normal.

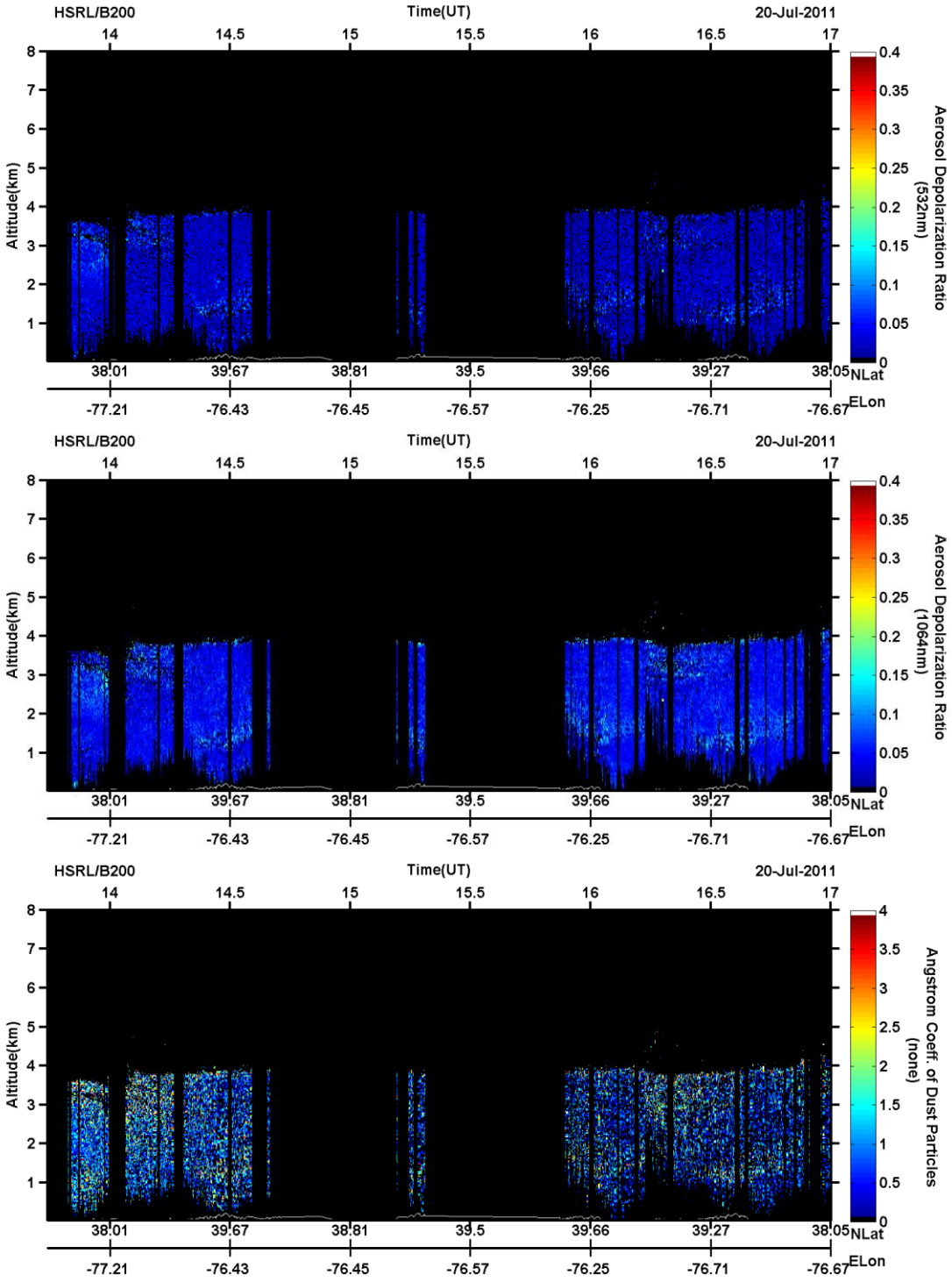
SUMMARY PLOTS:

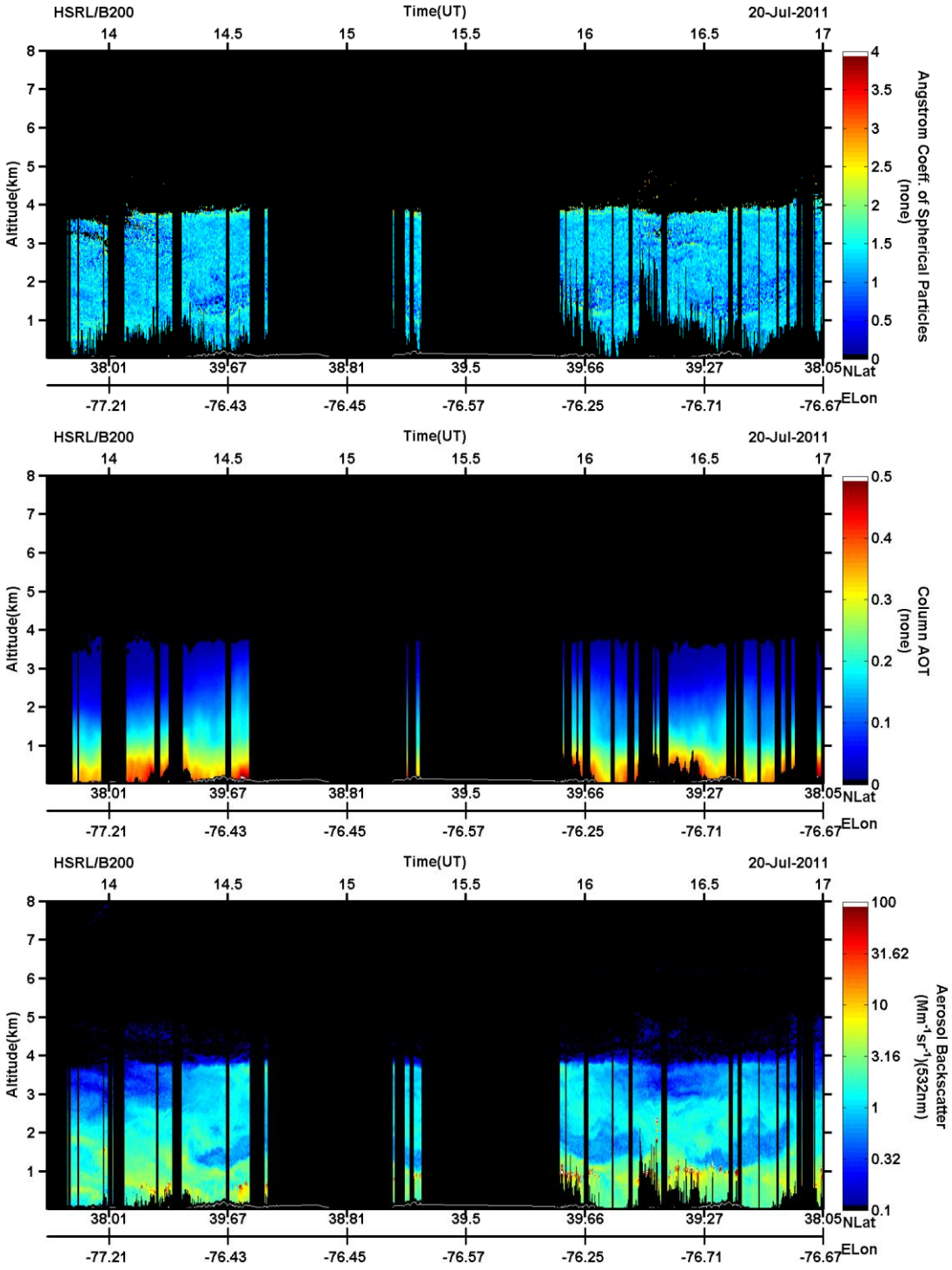

HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
0.4
0.25
0.16
0.1
0.06
0.04
0.03
0.02
0.01
Aerosol Extinction (km-1)
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon

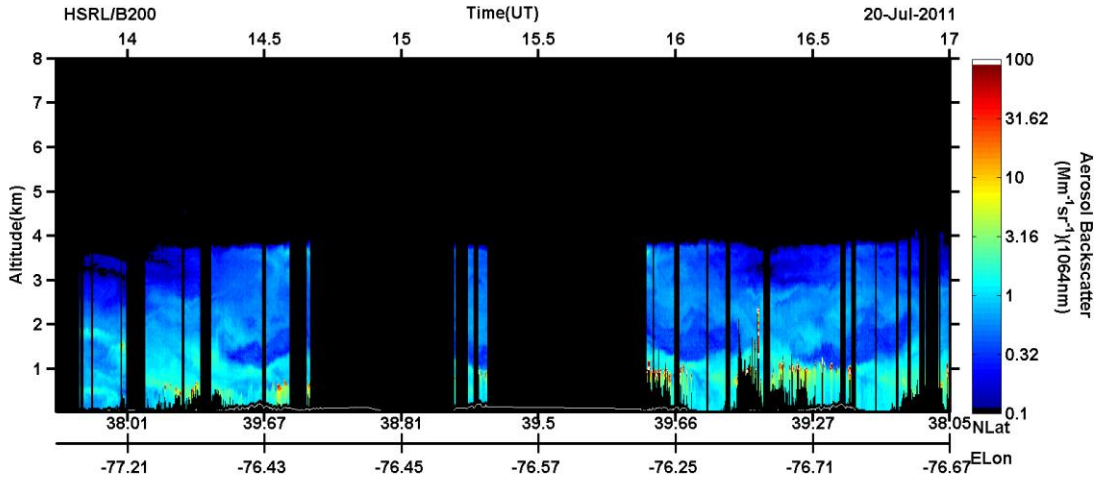

NASA Langley HSRL/B200 20-Jul-2011
14:30
15:57
16:34
16:09
16:47
14:15
16:22
15:00
14:03
17:01
13:49
13:24
13:37
39° N
38° N
37° N
76° W
0.5
0.4
0.3
0.2
0.1
0
AOT (532 nm)

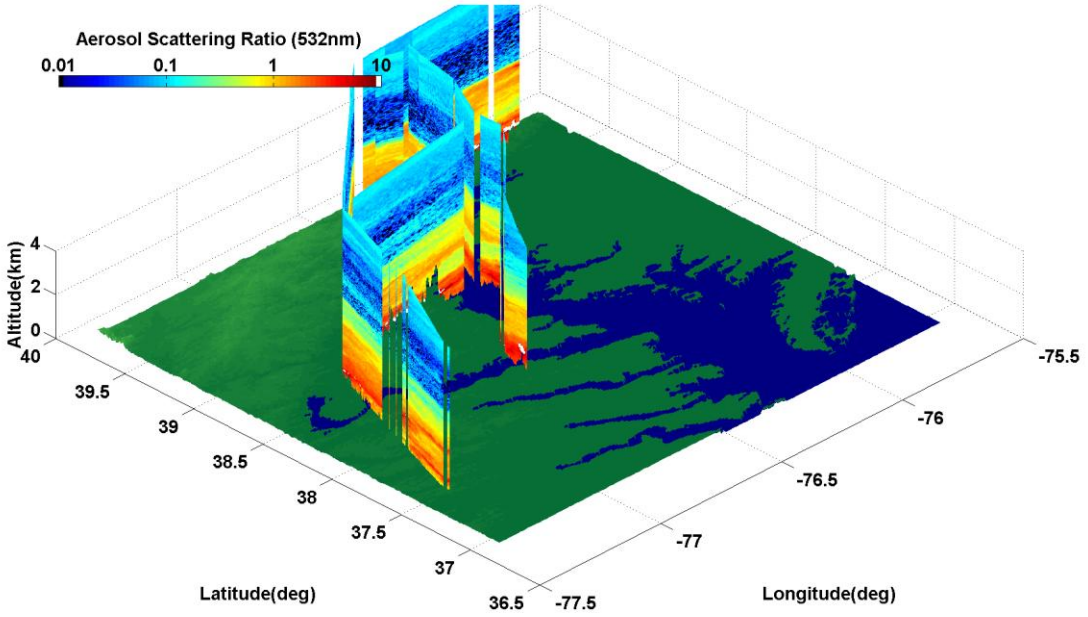

HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
1
2
3
4
5
6
7
8
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon
Extinction/Backscatter Ratio (sr)
100
80
60
40
20
0
HSRL/B200
Time(UT)
20-Jul-2011
Aerosol Wavelength Dependence (1064nm/532nm)
2
1.5
1
0.5
0
HSRL/B200
Time(UT)
20-Jul-2011
Total Attn. Backscatter 532 (Mm-1sr-1)(532nm)
100
31.62
10
3.16
1
0.32
0.1

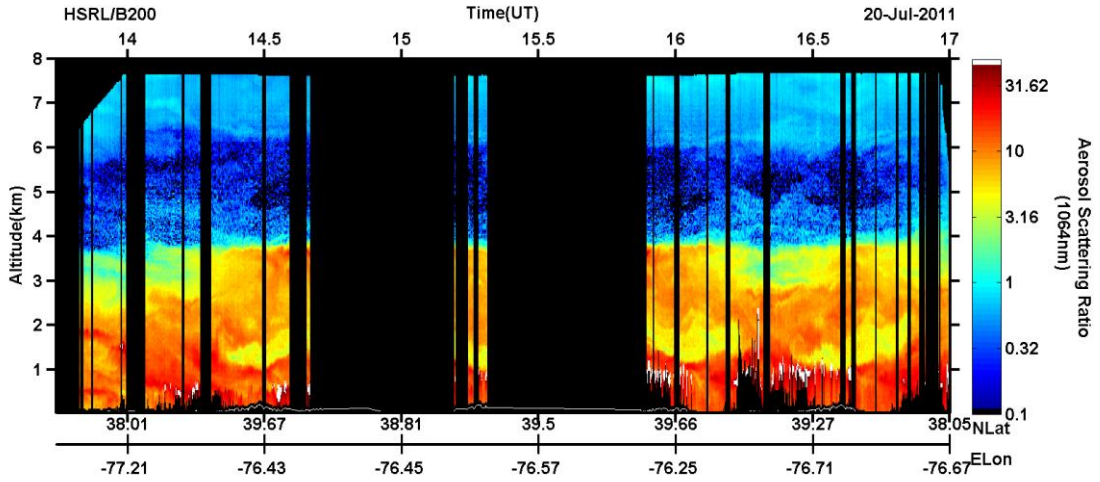

HSRL/B200
Time(UT)
20-Jul-2011
13.5
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
10
3.16
1
0.32
0.1
0.03
0.01
Aerosol Scattering Ratio
(532nm)
37.1
38
39.67
38.81
39.49
39.66
39.27
38.05
NLat
-76.54
-77.22
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon
HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
4
3.5
3
2.5
2
1.5
1
Ratio of Depolarization
(1064nm/532nm)
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon
HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
10
3.16
1
0.32
0.1
0.03
0.01
Total Attn. Backscatter 1064
(Mm-1sr-1)(1064nm)
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon

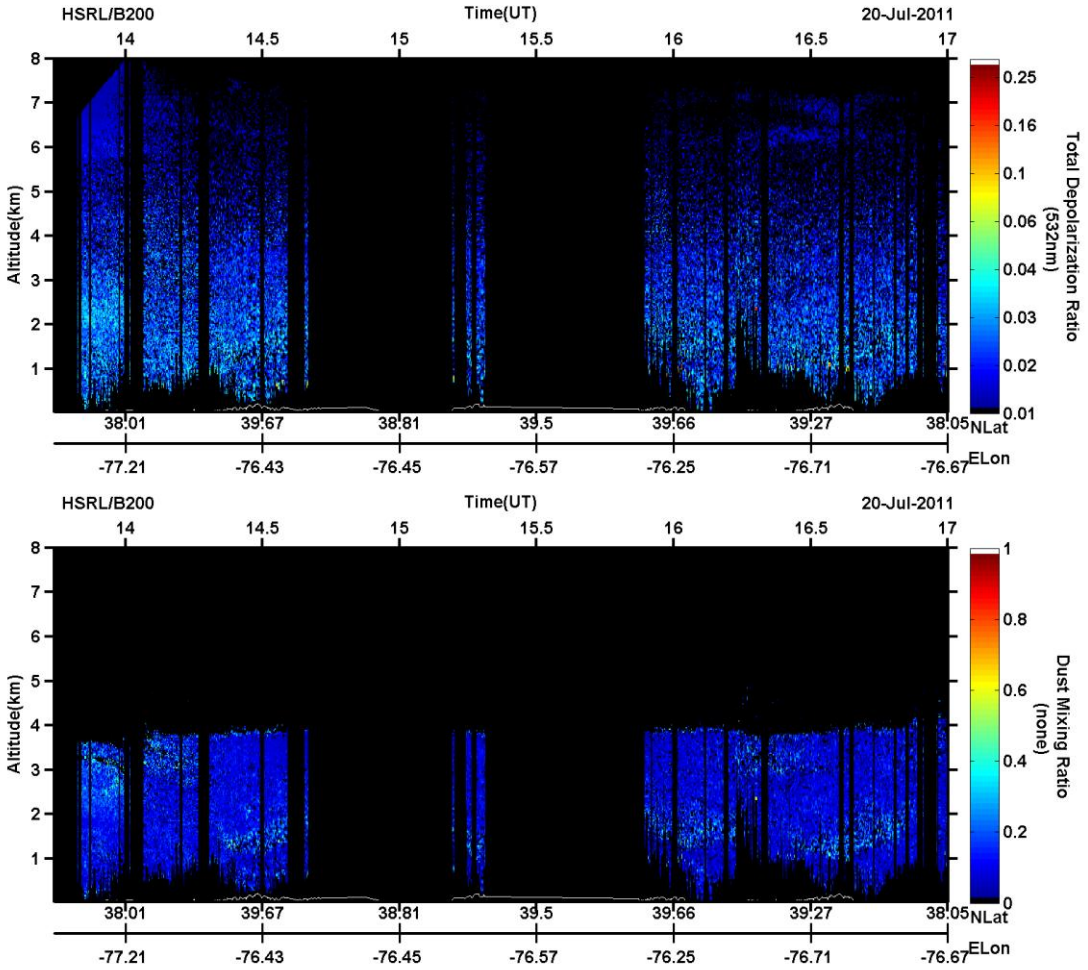

HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
1
2
3
4
5
6
7
8
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon
Aerosol Depolarization Ratio (532nm)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
HSRL/B200
Time(UT)
20-Jul-2011
Aerosol Depolarization Ratio (1064nm)
HSRL/B200
Time(UT)
20-Jul-2011
Angstrom Coeff. of Dust Particles (none)
0
0.5
1
1.5
2
2.5
3
3.5
4


HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon
Angstrom Coeff. of Spherical Particles
(none)
4
3.5
3
2.5
2
1.5
1
0.5
0
HSRL/B200
Time(UT)
20-Jul-2011
Column AOT
(none)
0.5
0.4
0.3
0.2
0.1
0
HSRL/B200
Time(UT)
20-Jul-2011
Aerosol Backscatter
(Mm-1sr-1)(532nm)
100
31.62
10
3.16
1
0.32
0.1


HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
100
31.62
10
3.16
1
0.32
0.1
Aerosol Backscatter
(Mm-1sr-1)(1064nm)
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon


Aerosol Scattering Ratio (532nm)
0.01
0.1
1
10
Altitude(km)
4
2
0
40
39.5
39
38.5
38
37.5
37
36.5
Latitude(deg)
-77.5
-77
-76.5
-76
-75.5
Longitude(deg)


HSRL/B200
Time(UT)
20-Jul-2011
14
14.5
15
15.5
16
16.5
17
Altitude(km)
8
7
6
5
4
3
2
1
31.62
10
3.16
1
0.32
0.1
Aerosol Scattering Ratio
(1064nm)
38.01
39.67
38.81
39.5
39.66
39.27
38.05
NLat
-77.21
-76.43
-76.45
-76.57
-76.25
-76.71
-76.67
ELon



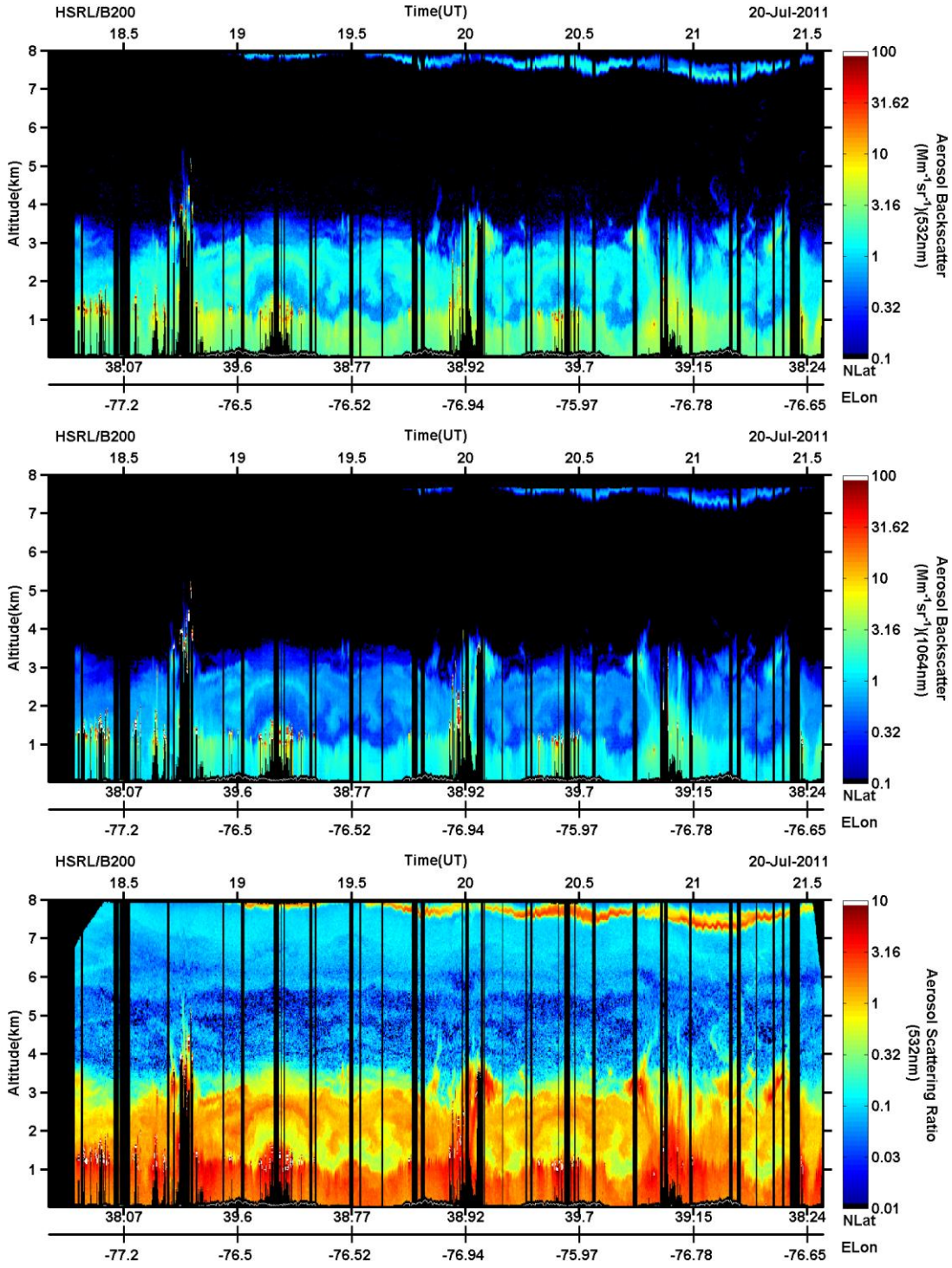
FLIGHT: Afternoon science flight (2 of 2)

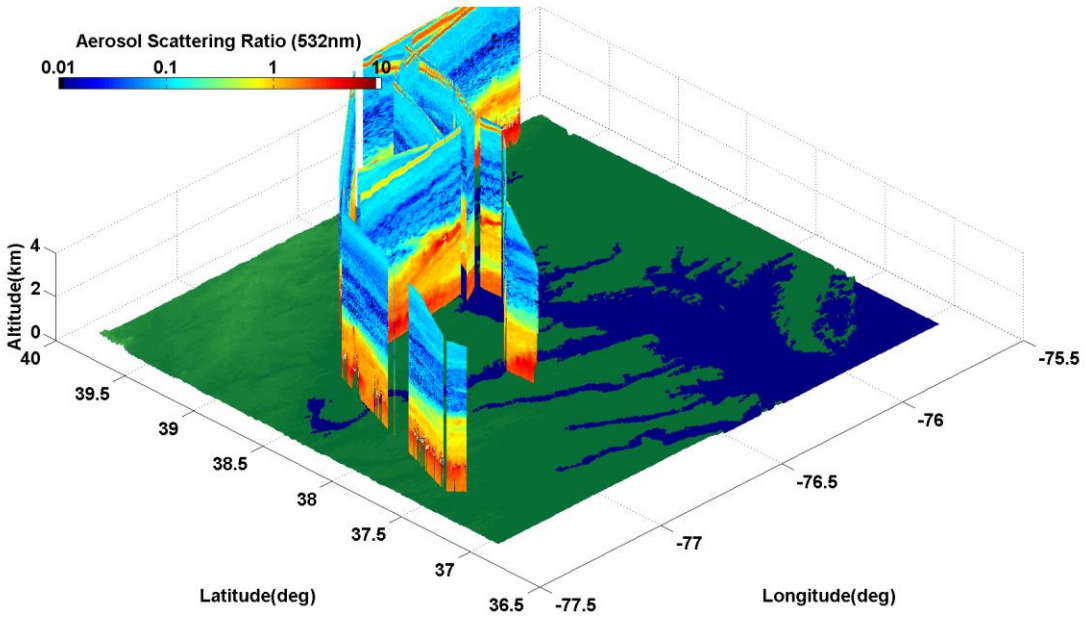
DATE: July 20, 2011

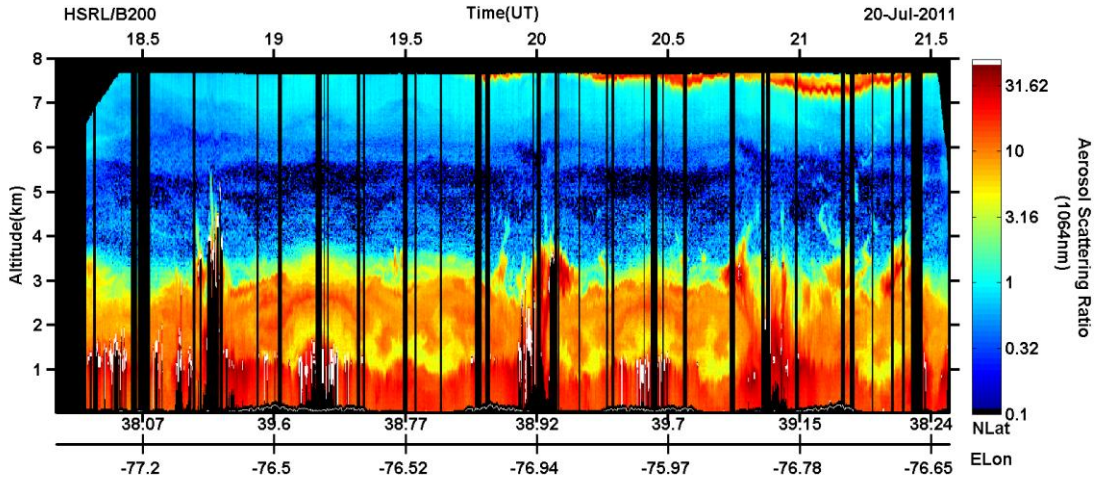
DURATION: 3.9 hours

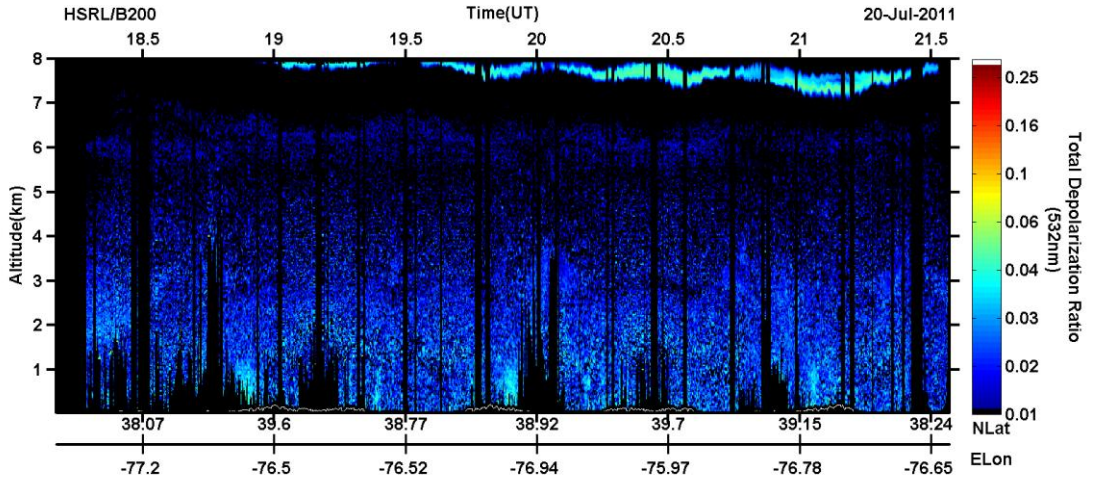
SUMMARY: Takeoff was at 1:55 PM local time from Newport News, VA. Hazy and humid conditions persisted from the morning flight with the amount of cloud cover increasing, including light cirrus above the UC-12. A thin layer of brown aerosol was present throughout much of the flight just below the aircraft altitude. HSRL operated nominally.

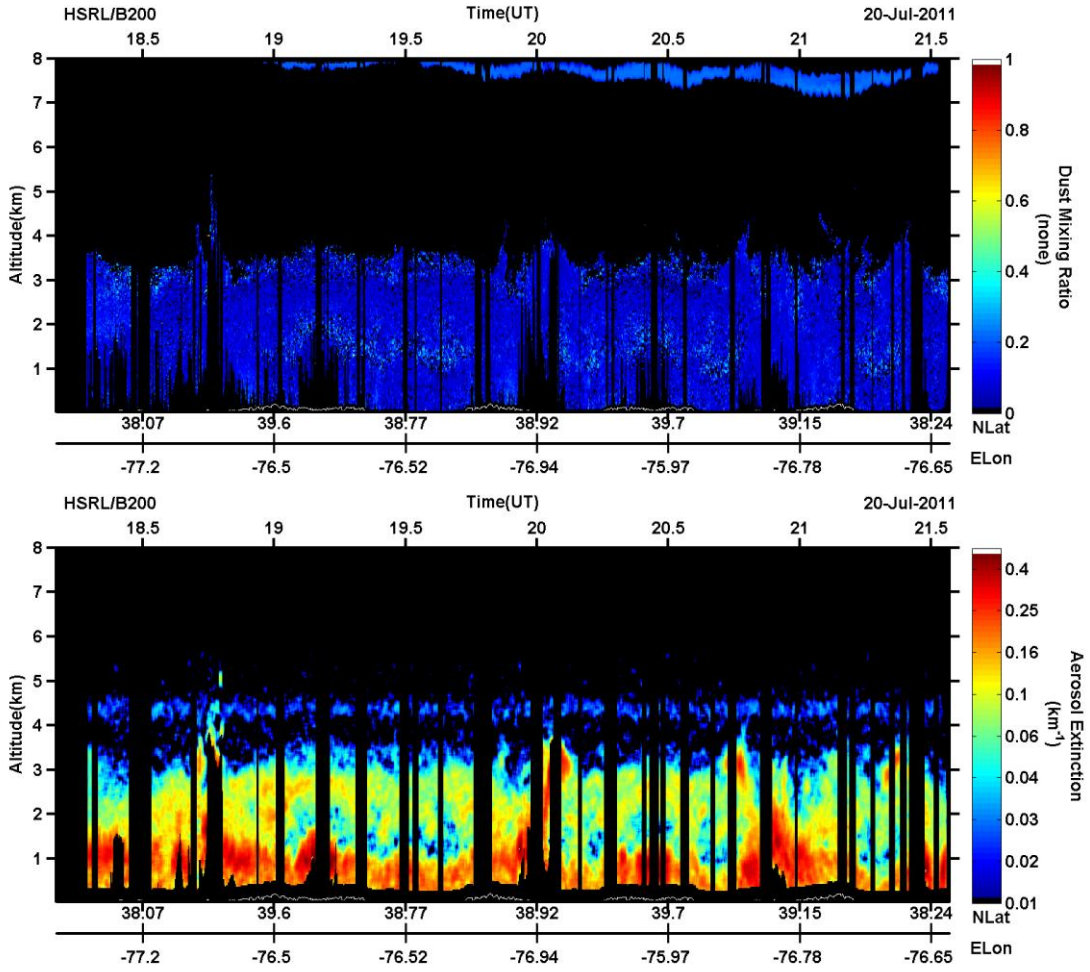
SUMMARY PLOTS:

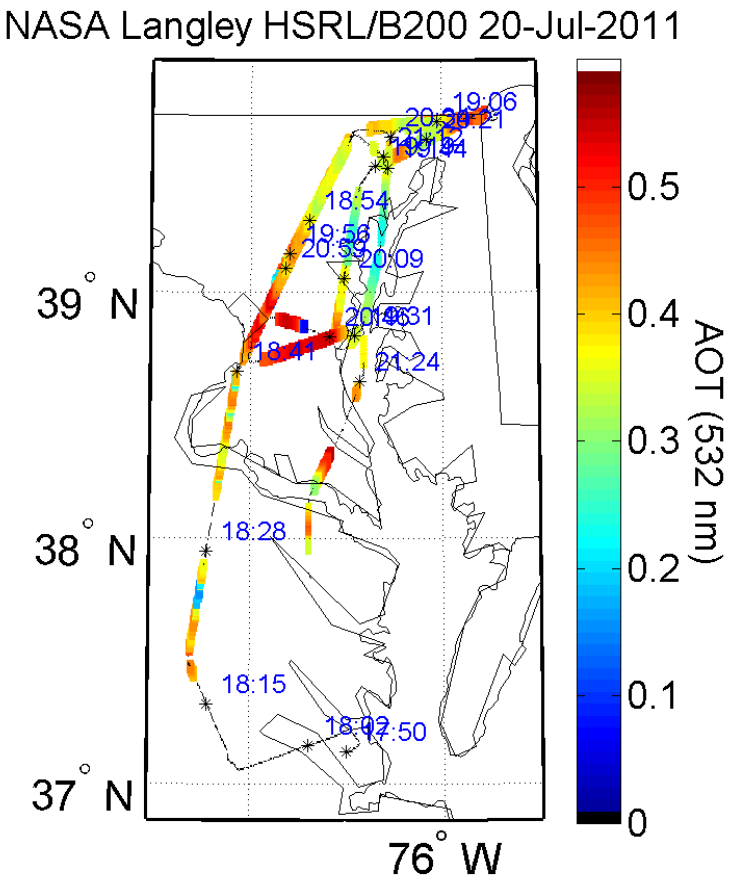

HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
38.07
39.6
38.77
38.92
39.7
39.15
38.24
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
NLat
ELon
Aerosol Backscatter (Mm-1sr-1)(532nm)
100
31.62
10
3.16
1
0.32
0.1
Aerosol Backscatter (Mm-1sr-1)(1064nm)
Aerosol Scattering Ratio (532nm)
10
3.16
1
0.32
0.1
0.03
0.01

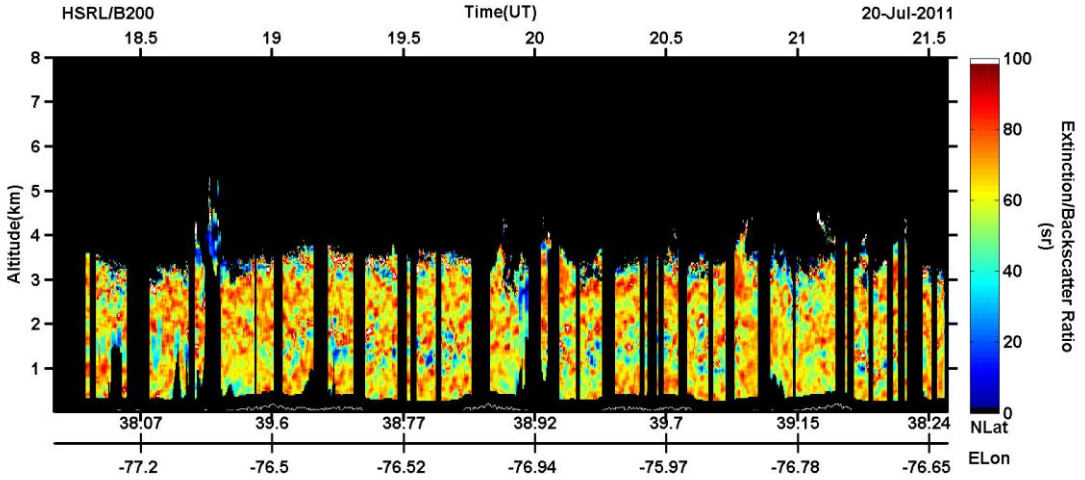

Aerosol Scattering Ratio (532nm)
0.01
0.1
1
10
Altitude(km)
4
2
0
40
39.5
39
38.5
38
37.5
37
36.5
Latitude(deg)
-77.5
-77
-76.5
-76
-75.5
Longitude(deg)

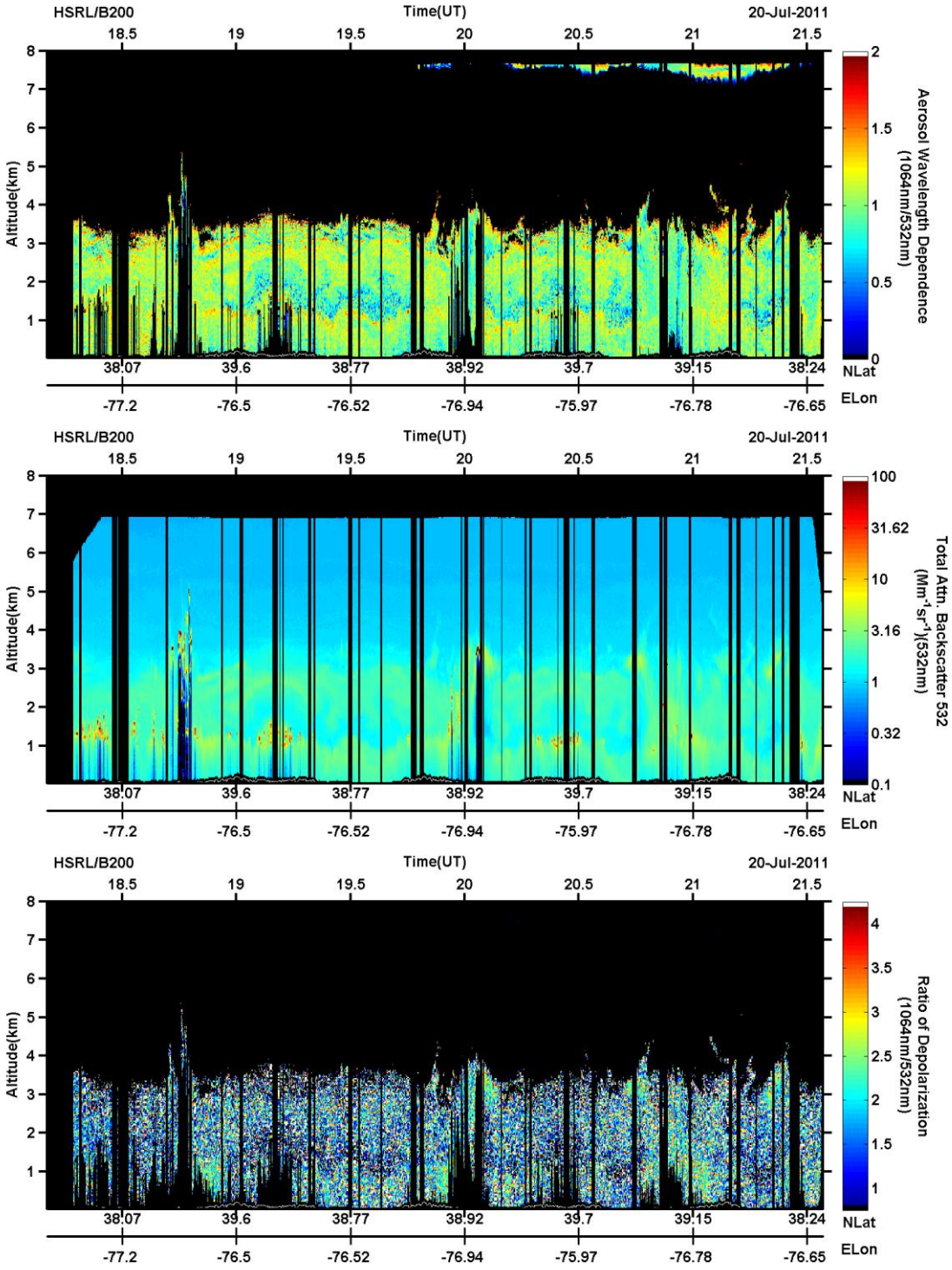

HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
38:07
39.6
38:77
38:92
39.7
39:15
38:24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon
31.62
10
3.16
1
0.32
0.1
Aerosol Scattering Ratio
(1064nm)

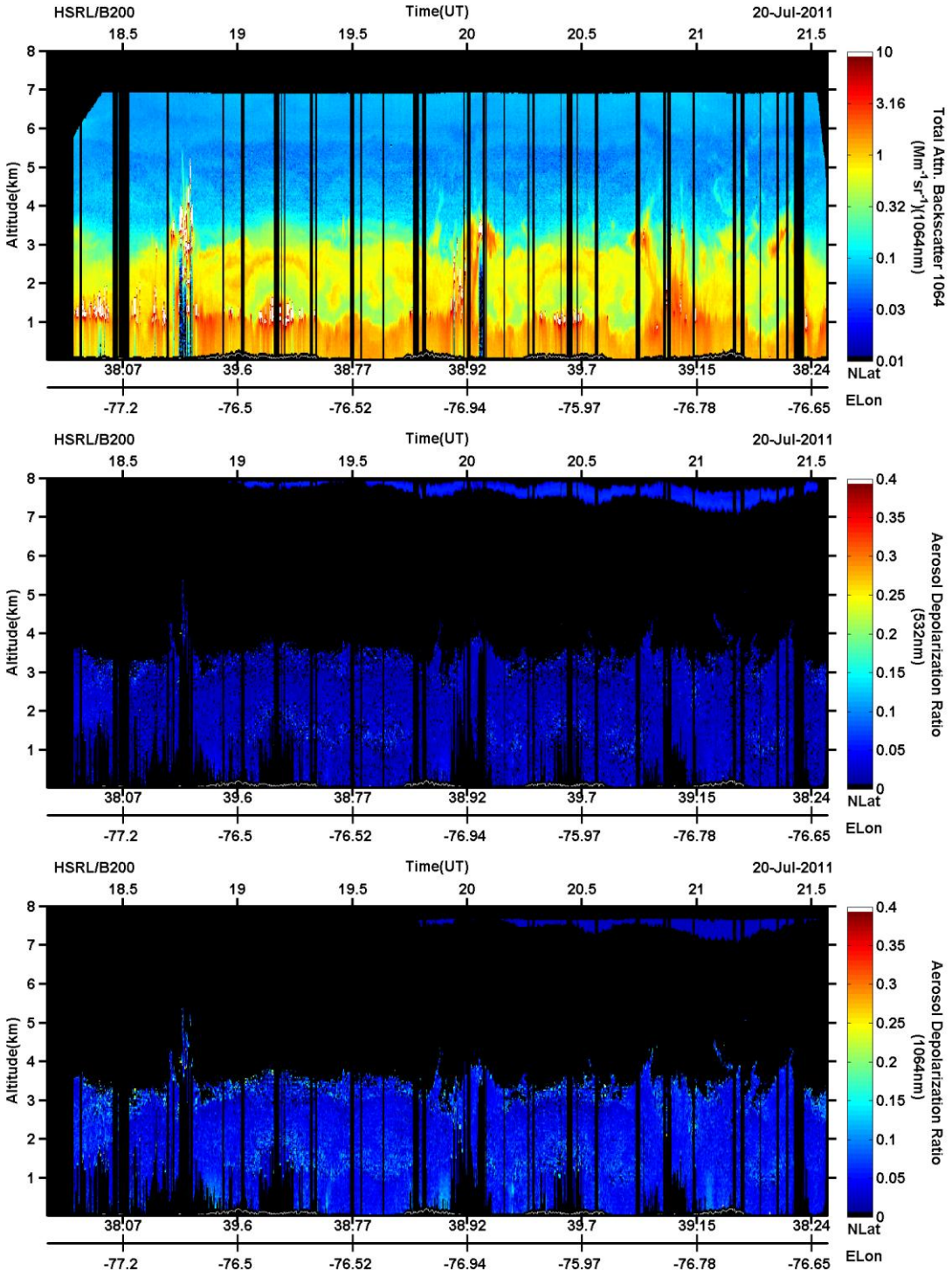

HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
38:07
39.6
38:77
38:92
39.7
39:15
38:24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon
0.25
0.16
0.1
0.06
0.04
0.03
0.02
0.01
Total Depolarization Ratio
(532nm)

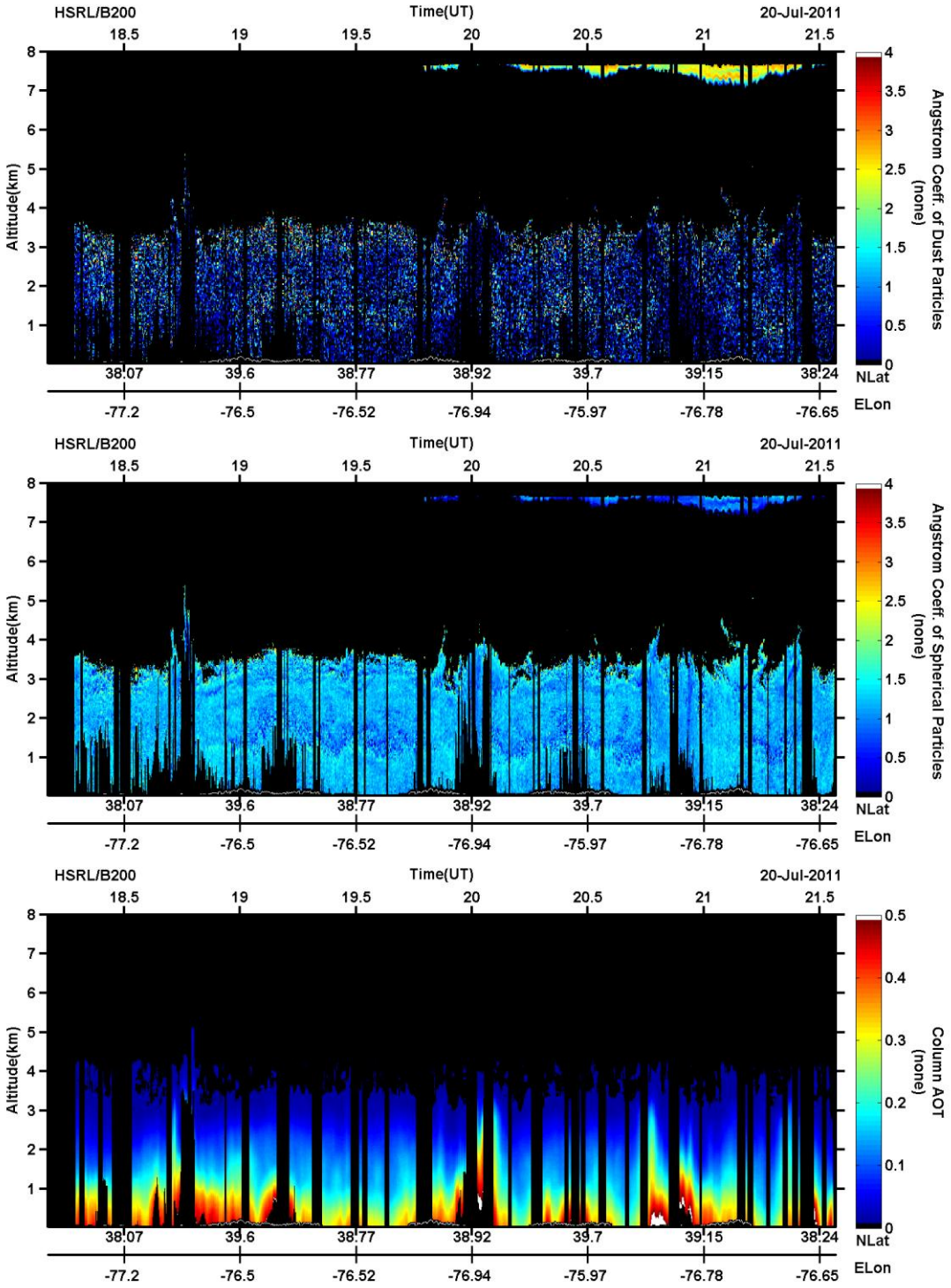

HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
Dust Mixing Ratio
(none)
1
0.8
0.6
0.4
0.2
0
38.07
39.6
38.77
38.92
39.7
39.15
38.24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon
HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
Aerosol Extinction
(km-1)
0.4
0.25
0.16
0.1
0.06
0.04
0.03
0.02
0.01
38.07
39.6
38.77
38.92
39.7
39.15
38.24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon


NASA Langley HSRL/B200 20-Jul-2011
19:06
18:54
20:09
18:41
21:24
18:28
18:15
17:50
39° N
38° N
37° N
76° W
0.5
0.4
0.3
0.2
0.1
0
AOT (532 nm)


HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
38.07
39.6
38.77
38.92
39.7
39.15
38.24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon
100
80
60
40
20
0
Extinction/Backscatter Ratio
(sr)


HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
38.07
39.6
38.77
38.92
39.7
39.15
38.24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon
Aerosol Wavelength Dependence
(1064nm/532nm)
2
1.5
1
0.5
0
HSRL/B200
Time(UT)
20-Jul-2011
Total Attn. Backscatter 532
(Mm-1sr-1)(532nm)
100
31.62
10
3.16
1
0.32
0.1
HSRL/B200
Time(UT)
20-Jul-2011
Ratio of Depolarization
(1064nm/532nm)
4
3.5
3
2.5
2
1.5
1


HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
8
7
6
5
4
3
2
1
10
3.16
1
0.32
0.1
0.03
0.01
Total Attn. Backscatter 1064 (Mm-1sr-1)(1064nm)
38.07
39.6
38.77
38.92
39.7
39.15
38.24
NLat
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65
ELon
HSRL/B200
Time(UT)
20-Jul-2011
Altitude(km)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Aerosol Depolarization Ratio (532nm)
NLat
ELon
HSRL/B200
Time(UT)
20-Jul-2011
Altitude(km)
Aerosol Depolarization Ratio (1064nm)
NLat
ELon


HSRL/B200
Time(UT)
20-Jul-2011
18.5
19
19.5
20
20.5
21
21.5
Altitude(km)
Angstrom Coeff. of Dust Particles (none)
Angstrom Coeff. of Spherical Particles (none)
Column AOT (none)
NLat
ELon
38.07
39.6
38.77
38.92
39.7
39.15
38.24
-77.2
-76.5
-76.52
-76.94
-75.97
-76.78
-76.65